Exploring the Ratio of Dumbbell Press to Flat Bench Press

**Many weightlifters wish to track the ratio between the weight they use for dumbbell press (using two, equal size dumbbells), compared to flat bench press, (using a bar and equal size plates on either side).The goal of the ratio is to compare how much someone is lifting two dumbbells versus how much they are able to lift the weighted barbell. You obtain the ratio by multiplying the weight of one dumbbell by 2 (to account for the two weights that the person would hold) and dividing that weight by the amount someone is able to barbell bench press.**

A screenshot of a calculator

Description automatically generated**Below is a dataset with observations from 18 weightlifters and their corresponding ratio.**

**1. What is the average ratio between dumbbell press and flat bench press?**

**2. Find the values for the first and third quartiles of this data set and interpret what they mean.**

**3. Find the interquartile range (IQR) for the 18 weightlifters**

**4. Based on the IQR and using the “1.5 IQR Rule” for outliers, are there any discernable outliers in this dataset?**

**5. The standard deviation of this dataset is 0.0873. Using this, create a 95% confidence interval for the mean ratio between flat dumbbell press and barbell bench press and interpret it.**

**5. The standard deviation of this dataset is 0.0873. Create a 99% confidence interval for the mean ratio between flat dumbbell press and barbell bench press and interpret it.**

**6. Based on the IQR and using the “1.5 IQR Rule” for outliers, are there any discernable outliers in this dataset?**

**A graph of a bar graph

Description automatically generated7. The graph to the right shows a histogram of the data. Approximately what percentage of the weightlifters observed have a ratio of 0.7 or above?**

**8. Based on the graph above and the specific observations, what could be a concern regarding the spread of the data, and what is a possible solution.**

**9. What potential problems could arise from the way the data was collected?**